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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/501,987	06/06/2005	Lee Chen	255873US6YA PCT	2084
22850	7590	08/17/2006		
C. IRVIN MCCLELLAND OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C. 1940 DUKE STREET ALEXANDRIA, VA 22314			EXAMINER OLSEN, ALLAN W	
			ART UNIT	PAPER NUMBER
			1763	

DATE MAILED: 08/17/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/501,987

Applicant(s)

CHEN, LEE

Examiner

Allan Olsen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 12 June 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-39 is/are pending in the application.
- 4a) Of the above claim(s) 2239 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-11 and 13-21 is/are rejected.
- 7) ☒ Claim(s) 12 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 July 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Election/Restrictions***

Applicant's election with traverse of Group I (method claims 1 and 3-21 in the reply filed on June 12, 2006 is acknowledged. The traversal is on the grounds that, by not identified two or more sub-classes that must be searched the Patent Office failed to show that a serious burden exists in searching all of the claims. Additionally, applicant notes "thousands of U.S. Patents have issued in which many more than two subclasses are searched".

This is not found persuasive because the identification of two or more subclasses is not the standard for determining that a burden exists. Furthermore, the search of the elected invention will almost certainly include a search of two or more subclasses that would not be included in a search of the nonelected invention. Additionally, the inventions of Group I and Group II of this 371, national stage application, do not share a special technical feature which speaks to the divergent nature of the required searches.

The requirement is still deemed proper and is therefore made FINAL.

### ***Claim Objections***

Claims 3-11 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim because they are dependent upon claim 2 which has been cancelled. Applicant is required to cancel the claims, or amend the claims to place the claims in proper dependent form, or rewrite the claims in independent form.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

**Claims 1, 3, 4, 7, 11, 13-15, 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent 4,723,903 issued to Okazaki et al. (hereinafter, Okazaki) in view of US Patent 6,464,889 issued to Lee et al. (hereinafter, Lee).**

Okazaki teaches etching completely through a bimetallic layer comprising Ni and Ti. Okazaki teaches etching the Nickel component with a CO plasma and plasma etching the Ti component with CF<sub>4</sub>.

Okazaki does not teach using a hydrogen halide in the etchant. Okazaki does not teach etching with a substrate temperature of between 40° C and 100° C. Okazaki does not teach gas flow rates.

Lee teaches plasma etching Ti with an inert gas mixed with either HCl or CF<sub>4</sub> at a temperature between 25° C and 100° C and Li teaches flow rates well below %00 sccm.

It would have been obvious to one skilled in the art to substitute HCl for the CF<sub>4</sub> of Okazaki because Lee teaches that CF<sub>4</sub> and HCl are functionally equivalent with respect to the plasma etching of Ti. It would have been obvious to one skilled in the art to etch Okazaki's bimetal layer at a temperature of between 40° C and 100° C and with gas flow rates of less than 500 sccm because when combining the teachings of Okazaki and Lee the skilled artisan would look to Lee's teaching because Okazaki is completely silent with regard to these process parameters. Furthermore, it would have been

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obvious to one skilled in the art to optimize process variable such as flow rate and temperature.

**Claims 5, 9, 16 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Okazaki and Lee as applied above to claim 1, in view of the English language JPO abstract of JP 02088782, hereinafter, Hitachi.**

Li does not teach using hydrogen halides other than HCl.

Hitachi teaches etching with a mixture of CO and hydrogen halide.

It would have been obvious to one skilled in the art to replace the HCl of Li with one of HF, HBr and HI because through Hitachi's generic teaching of using a hydrogen halide, the skilled artisan would immediately envisaged each of HF, HCl, HBr and HI because they are very common members of a very small class of compounds. As such, Hitachi teaches that a plasma of HF/CO or HBr/CO or HI/CO is functionally equivalent to the HCl/CO plasma of Li.

**Claims 8 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Okazaki and Lee as applied above to claim 1, in view of US Patent 6,156,666 issued to Tokushima.**

Okazaki and Lee do not teach using a CO<sub>2</sub> plasma to etch Ni.

Tokushima teaches plasma etching of Ni by using CO or CO<sub>2</sub> as an etchant.

It would have been obvious to one skilled in the art to use CO<sub>2</sub> in place of the CO taught by Okazaki because, with regard to plasma etching of Ni, Tokushima teaches that CO and CO<sub>2</sub> are functionally equivalent.

**Claims 6, 10, 17 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Okazaki/Lee/Hitachi as applied above, respectively, to claims 5, 9, 16 and 20, in view of Tokushima.**

Okazaki/Lee/Hitachi do not teach using CO<sub>2</sub> to plasma etch Ni.

Tokushima teaches the plasma etching of Ni by using CO or CO<sub>2</sub> as an etchant.

It would have been obvious to one skilled in the art to use CO<sub>2</sub> in place of the CO taught by Okazaki because, with regard to plasma etching of Ni, Tokushima teaches that CO and CO<sub>2</sub> are functionally equivalent.

#### ***Allowable Subject Matter***

Claim 12 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

#### ***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any

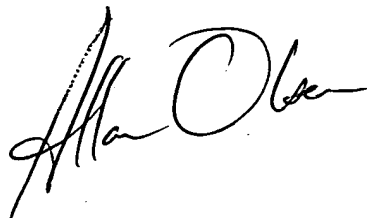
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extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Allan Olsen whose telephone number is 571-272-1441. The examiner can normally be reached on M, W and F: 1-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on 571-272-1435. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

A handwritten signature in black ink, appearing to read 'Allan Olsen', is written over a horizontal line.

Allan Olsen  
Primary Examiner  
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